ATTACHMENT A

Hawley's

Condensed Chemical

Dictionary

THIRTEENTH EDITION

Revised by

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ondary alcohols. The simplest member of the series is acetone, $CH_3C(O)CH_3$, but many more complex ketones are known.
Use: Solvents, especially for cellulose derivatives, in lacquers, paints, explosives, and textile processing.
See acetone; diethyl ketone; methyl ethyl ketone.

ketone, Michler's. See tetramethyldiaminobenzophenone.

ketonimine dye. A dye whose molecules contain the $-NH=C=$ chromophore group. There are only two members in the class: auramine and a closely related homolog, methyl aurin, in which a methyl group replaces one of the hydrogen atoms of aurin. These are basic dyes used on cotton with tannin or tartar emetic as mordant.

α-ketopropionic acid. See pyruvic acid.

γ-ketovaleric acid. See levulinic acid.

"Kevlar" ***[Du Pont].*** TM for an aromatic polyamide fiber of extremely high tensile strength and greater resistance of elongation than steel. Its high energy-absorption property makes it particularly suitable for use in belting radial tires, for which it was specifically developed; it is also used as a reinforcing material for plastic composities in bullet-proof vests, and in cordage products.
See aramid.

Keyes process. A distillation process involving the addition of benzene to a constant-boiling 95% alcohol-water solution to obtain absolute (100%) alcohol. On distillation, a ternary azeotropic mixture containing all three components leaves the top of the column while anhydrous alcohol leaves the bottom. The azeotrope (which separates into two layers) is redistilled separately for recovery and reuse of the benzene and alcohol.

kg. Abbreviation for kilogram. Equals 1000 grams.

Kick's law. The amount of energy required to crush a given quantity of material to a specified fraction of its original size is the same, regardless of the original size.

kier. A large metal tank or vessel in which wool or cotton fibers or fabrics are scoured, bleached, or dyed, usually in an alkaline solution (kier boiling).

kieselguhr. See diatomaceous earth.

kieserite. $MgSO_4 \cdot H_2O$. A natural magnesium sulfate occurring in enormous quantities in the Stassfurt salt beds (Germany), Austria, and India.
See epsomite; magnesium sulfate.

Kiliani-Fischer synthesis. Extension of the carbon atom chain of aldoses by treatment with cyanide. Hydrolysis of the cyanohydrins followed by reduction of the lactone yields the homologous aldose.

"killed" steel. Steel deoxidized by the addition of aluminum, ferrosilicon, etc., while the mixture is maintained at melting temperature until all bubbling ceases. The steel is quiet and begins to solidify at once without any evolution of gas when poured into the ingot molds.

kiln. (1) A refactory-lined cylinder, either stationary or rotary.
Use: Calcination of lime, magnesia, cement, ores, etc., and for incinerating gaseous, liquid, and solid wastes.
(2) A furnace for firing ceramic products.

kilo-. Prefix meaning 10^3 units (symbol k), e.g., 1 kg = 1 kilogram = 1,000 grams.

kilogram. (1) A mass identical with that of the international kilogram at the International Bureau of Weights and Measures in France. It is the mass of a liter of water at 4C.
(2) A force equal to the weight of one kilogram mass, measured at sea level.

kinematic viscosity. See viscosity.

kinetic chain length. The average number of molecules of a monomer converted to a polymer for each active center formed in an initiation reaction.

kinetics, chemical. Chemical phenomena can be studied from two fundamental approaches: (1) *thermodynamics*, a rigorous and exact method concerned with equilibrium conditions of initial and final states of chemical changes; (2) *kinetics*, which is less rigorous and deals with the rate of change from initial to final states under nonequilibrium conditions. The two methods are related. Thermodynamics, which yields the driving potential—a measure of the tendency of a system to change from one state to another—is the foundation upon which kinetics is built. The rate at which a change will occur depends upon two factors: (1) directly with driving force or potential, and (2) inversely with a resistance. A measure of the tendency of a system to resist chemical change is the so-called activation energy, which is independent of the driving force or so-called free energy of the reaction.
The diagram is a mechanical analogy illustrating the difference between activation energy and driving potential. The chemical system is represented by a sphere resting in a valley. The initial equilibrium state, A, is at a higher elevation than the final state, B. The difference in elevation between A and B is a measure of the free energy change of the

reactor fission products by solvent extraction followed by crystallization as ammonium pertechnetate, which is reduced with hydrogen. The metal is silver-gray in appearance, mp 2200C (4000F), d 11.5, slightly magnetic. Compounds of the types TcO_2, Tc_2O_7, NH_4TcO_4, etc. have been prepared. The pertechnetate ion has strong anticorrosive properties. Technetium and its alloys are superconductors and can be used to create high-strength magnetic fields at low temperature. Tc-99 (metastable) is the most widely used isotope in nuclear medicine.

Use: Metallurgical tracer, cryochemistry, corrosion resistance, nuclear medicine.

Technical Association of the Pulp and Paper Industry. (TAPPI). A professional group of scientists devoted to the interests of pulp and paper chemistry and technology. Founded in 1915, it has seven sections, each concerned with a specific phase of the industry. It also has 11 local sections that hold monthly meetings. The association publishes its own journal, as well as industry data sheets, bibliographies, technical monographs on subjects relating to the paper industry. It establishes standards of quality and testing procedures. The address is Technical Park, PO Box 105113, Atlanta, GA 30348.

"Tedlar" ***[Du Pont].*** TM for polyvinylfluoride film.

TEDP. Abbreviation for tetraethyl dithiopyrophosphate.
See sulfotepp.

"Tedur" ***[Mobay].*** TM for polysulfide polymers.
Available forms: Glass, mineral, and mineral/glass grades.
Use: Injection molding for high-temperature and performance electronic and automotive parts.

"Teflon" ***[Du Pont].*** TM for tetrafluoroethylene (TFE) fluorocarbon polymers available as molding and extrusion powders, aqueous dispersion, film, finishes, and multifilament yarn or fiber. The name also applies to fluorinated ethylene-propylene (FEP) resins available in the same forms. The no-stick cookware finishes may be of either type. Fibers are monofilaments made from copolymer of TFE and FEP.
Use: Packing, bearings, filters, electrical insulation, high-temperature industrial plastics, cooking utensils, plumbing sealants, coating glass fiber for architectural structure composites, bonding industrial

"Tego" ***[Rohm & Haas].*** TM for thin tissue impregnated with heat-convertible phenol-formaldehyde resin, supplied in rolls. Produces waterproof bond with plywood veneers.
Use: Hot-press bonding of furniture veneers, premium wall paneling.

TEL. Abbreviation for tetraethyl lead.

telluric acid. (hydrogen tellurate).
CAS: 7803-68-1. $H_2TeO_4 \cdot 2H_2O$ or H_6TeO_6.
Properties: White, heavy crystals. D 3.07, mp 136C. Soluble in hot water and alkalies; slightly soluble in cold water.
Derivation: Action of sulfuric acid on barium tellurate.
Hazard: As for tellurium.
Use: Chemical reagent.

telluric bromide. See tellurium tetrabromide.

tellurium.
CAS: 13494-80-9. Te. A nonmetallic element with many properties similar to selenium and sulfur. Atomic number 52, group VIA of the periodic table, aw 127.60, valences of 2, 4, 6; eight stable isotopes.
Properties: Silvery-white, lustrous solid with metal characteristics. D 6.24 g/cc (30C), Mohs hardness 2.3, mp 450C, bp 990C. Soluble in sulfuric acid, nitric acid, potassium hydroxide, and potassium cyanide solutions; insoluble in water. Imparts garlic-like odor to breath; can be depilatory. It is a p-type semiconductor and its conductivity is sensitive to light exposure.
Source: From anode slime produced in electrolytic refining of copper and lead.
Derivation: Reduction of telluric oxide with sulfur dioxide; by dissolving the oxide in a caustic soda solution and plating out the metal.
Grade: Powder, sticks, slabs, and tablets, 99.5% pure, crystals up to 99.999% pure.
Hazard: (Metal and compounds as tellurium) Toxic by inhalation. TLV: 0.1 mg/m³ of air.
Use: Alloys (tellurium lead, stainless steel, iron castings), secondary rubber vulcanizing agent, manufacture of iron and stainless steel castings, coloring agent in glass and ceramics, thermoelectric devices, catalysts, with lithium in storage batteries for spacecraft.
For further information refer to the Selenium-Tellurium Development Association, 11 Broadway, New York, NY 10003.

tellurium bromide. See tellurium dibromide and tellurium tetrabromide.